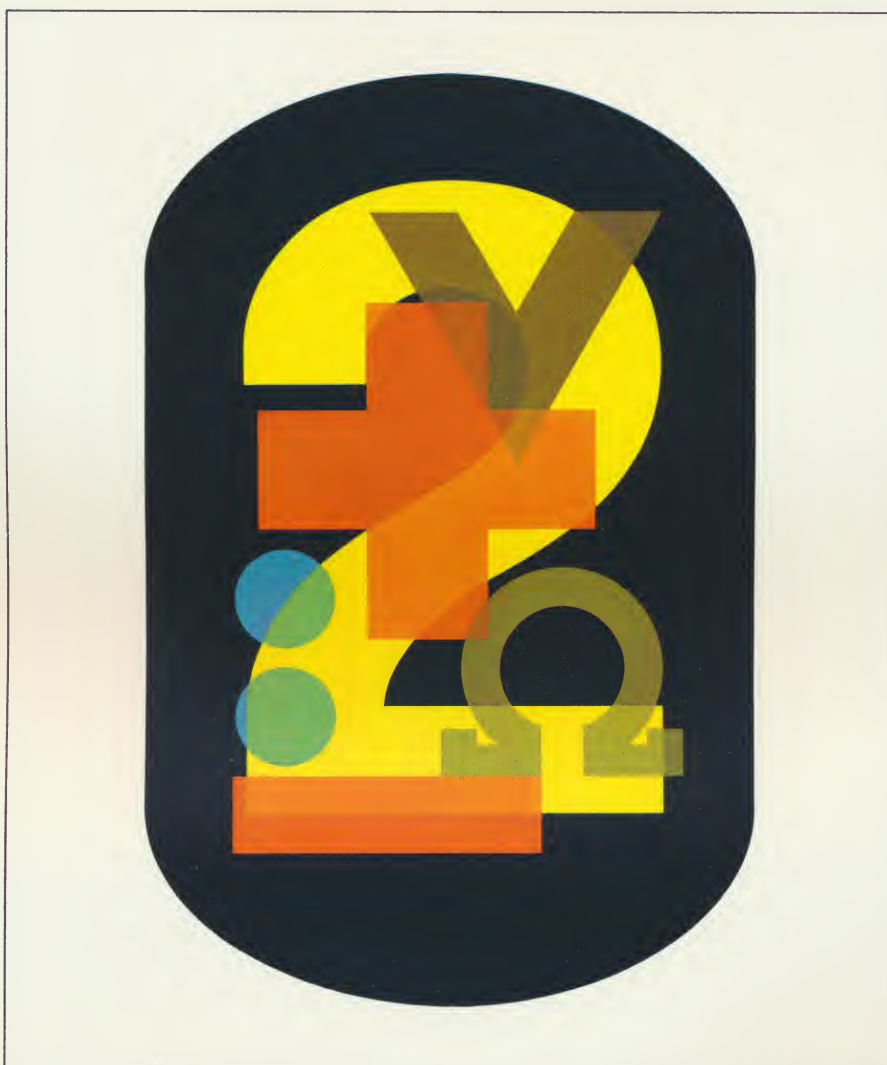


# DVM'S

FAIRCHILD INSTRUMENTATION





## FAIRCHILD DIGITAL MULTIMETERS

Fairchild Instrumentation offers the only full line of digital multimeters in the industry. These instruments have a unique common feature: they combine the noise rejection characteristics of integrating meters with the stability that is inherent in comparing the input voltage to an internal reference.

Fairchild's DVM's are made with integrated circuits wherever practical. They are compact, modular and highly reliable. The use of integrated circuits has simplified production procedures and has reduced manufacturing costs. The savings are passed on to you; you get better performance at a lower cost.

The Fairchild line consists of four DVM's and their related plug-ins:

Model 7200 is a five-digit instrument designed for maximum flexibility in high accuracy systems applications and laboratory use. (For details see page 6.)

Model 7100A is a four-digit instrument, fully guarded, for laboratory and production line testing (see page 8).

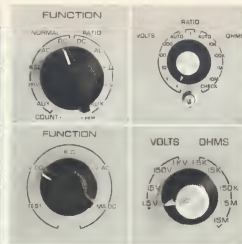
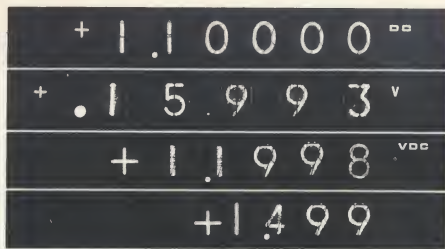
Model 7000 is a four-digit instrument for general testing purposes. It offers accurate performance at an economy price (see page 9).

Model 7050 is a low-cost three-digit meter used to replace analog meters and panel indicators for improved accuracy at comparable expense (see page 10).

Suitable plug-in modules or circuit boards may be added to these instruments to further extend their capabilities and improve their usefulness.





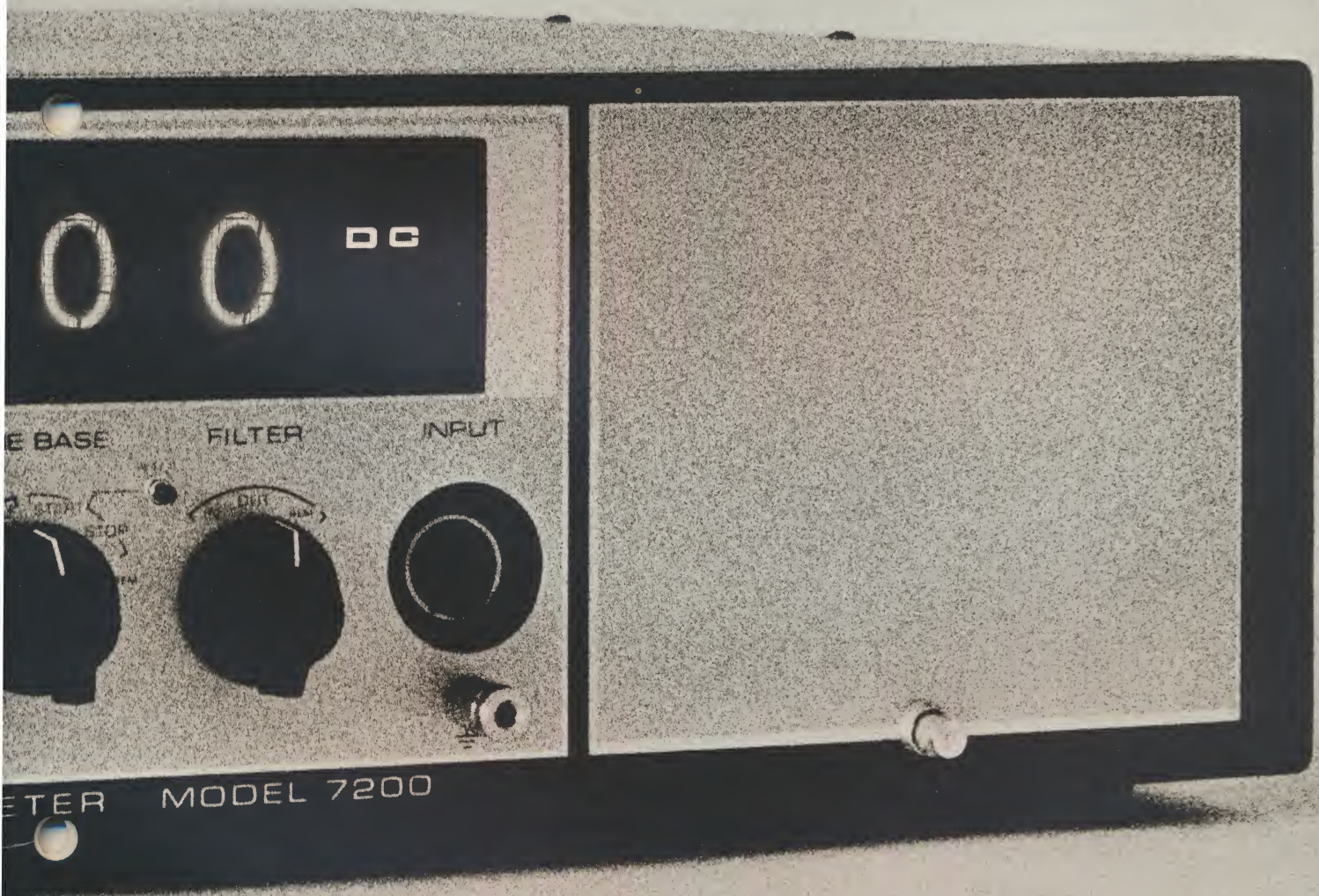


A complete line of multimeters:

7200	\$3500.00
7100A	\$2075.00
7000	\$1150.00
7050	\$ 299.00

Multifunction capabilities of Fairchild's DVM's extend the usefulness of the instruments.

Integrated circuits are used wherever practical to achieve optimum cost/performance ratios, and to produce compact, modular, highly reliable and accurate instruments.





## A GUIDE TO ACCURACY SPECIFICATIONS

Lack of uniform standards for specifying the accuracy of digital meters often creates doubt as to what a manufacturer's specifications really mean. The following list is a guide to the criteria used by Fairchild in specifying the factors which influence accuracy.

**Accuracy** specifications normally include two components: the first is a variable error proportional to the reading, expressed as  $\pm X\%$  of reading. The second is a fixed error, expressed as either  $\pm Y\%$  of full-scale, or  $\pm W$  digits.

**Overranging** is the ability of a DVM to make measurements beyond its specified full-scale rating. Such measurements can be inaccurate if the linearity limits of the instrument are exceeded. Fairchild DVM specifications include the overranging limits within which measurements can be made at the **full specified accuracy** of the instrument.

**Stability** of Fairchild DVM's is stated in terms of the internal reference to which the input is compared. As long as this refer-

ence remains within specified limits, the accuracy of the instrument will not deteriorate. Thus, a stability specification on the internal reference for a three-month period means that the meter will require no calibration for at least three months.

**Resolution** is the voltage increment corresponding to one digit in the lowest range. However, some instruments may not resolve that closely. To verify the resolution of an instrument, apply a known external voltage to the DVM and increase this input a fraction of a digit at a time until the DVM reading changes by one digit. This procedure will determine how much of a voltage increment is required to change the DVM reading by one digit, and will provide a true indication of resolution.

**Temperature effects** are stated by specifying the temperature coefficients or by including a temperature range in the accuracy specification.

**Line voltage effects** are included in the accuracy specification, since regulated power supplies accommodate  $\pm 10\%$  changes in line voltage without error.

**Attenuator errors** are minimal and are included in the accuracy specification.

**Step response time** is the time between a step input and the digital readout. Input filters often have response times of 0.2 to 2.0 seconds. Integrating DVM's do not require input filters and their step response time is equivalent to the measurement time. Step response time is therefore not separately specified.

**Polarity response time** includes the time required to change polarity. In Fairchild integrating DVM's, this response time is included in measurement time and is not separately specified.

**Range response time** includes a change of one range up or down, depending upon the worst case.

**Calibration errors:** Fairchild calibrates the instruments to be well within specifications before they are shipped. Transportation shocks, however, may cause the instruments to change calibration. Therefore, the customer should check them to his standards upon receipt, and establish a permanent calibration record.

**Internal noise:** Integration and careful design minimize the effects of internal noise. These effects can be a limitation in the low ranges, and they are included in the accuracy specification.

**External noise:** Integration and guarding result in accurate performance in the presence of external noise. Since Fairchild DVM's require no filters, noise rejection is achieved without loss in response time.

**Input impedance:** Fairchild DVM's have more than 1000 Megohm input impedance on low ranges to prevent errors when making measurements on high impedance sources. Such errors are possible with DVM's possessing input impedance values as high as 10 Megohms.

## ACCURATE MEASUREMENTS IN THE PRESENCE OF NOISE

Two design features provide exceptionally high noise rejection: integration and guarding. Integration averages or integrates the noise superimposed on a signal. It is most effective at frequencies of 60, 120, 180 Hz and other multiples of the power line







frequency. The rejection of noise superimposed on the signal is called **normal mode rejection (NMR)**. Guarding virtually eliminates the effects of noise introduced by ground loop currents due to multiple grounds. Reduction of the effects of this noise signal is called **common mode rejection (CMR)**.

**Normal mode rejection:** Digital voltmeters using successive approximation, tracking logic, or ramp techniques measure the input signal as it existed at some specific instant in time. If a peak or valley of superimposed noise occurs at that exact instant, the reading is in error by the peak magnitude of the noise. Tracking logic machines have controls for adjusting the amount of change required to initiate a new reading. This reduces the effects of noise at the expense of resolution and accuracy.

The usual way to reduce noise is through filters. But filters slow the instrument's response to a step function.

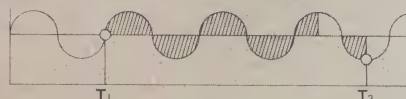
Integrating voltmeters average out at the value of the input signal and most noise peaks are therefore canceled out, as is illustrated in the diagram below. Normal mode rejection in integrating meters is achieved with no loss in accuracy or resolution, and without slowing down the step response time of the instrument.

**Common mode rejection:** In practical applications, the digital voltmeter and its voltage source are often grounded at different

points and these points have a potential difference between them. This causes a voltage to appear at the input terminals, which is superimposed on the signal to be measured. This usually occurs at the power line frequency. Common mode rejection is defined as the ratio in db between the peak common mode voltage and the peak deviation, or error, it causes on the voltmeter.

A good way to achieve common mode rejection is by guarding the instrument. Guarding consists of a box within a box construction with the guard shield electrically isolated from the rest of the instrument. Common mode rejection in Fairchild DVM's is specified with 1000 ohms of resistance between source and voltmeter input. The apparent CMR of an instrument is 10 times greater if only 100 ohms unbalance is used.

Guarding adds to the manufacturing costs of the instrument, but it provides extremely high reduction of common mode noise, and eliminates restrictions on grounding of the signal source, the DVM, and other system components.





## FAIRCHILD MODEL 7200 MULTIMETER

The Fairchild 7200 is a precision instrument designed for maximum flexibility use in high accuracy systems or the laboratory. Its unique principle of operation combines the noise rejection features of integrating meters with the stability associated with comparing the input voltage to an internal reference. It is a fully-guarded instrument to provide high common mode rejection.

The basic instrument measures DC voltage and ratio and serves as a totalizer up to frequencies of 1MHz. An optional plug-in board provides a time base for frequency measurements. Separate plug-in units for measuring low level DC voltage, AC voltage, and resistance are also optionally available. Space is also provided for remote programming, output decoder, and special input filter options. All controls have a logic interlock which minimizes human error in the operation of the instrument.

The 7200 is made with silicon solid state components and integrated circuits for maximum performance and reliability at a price well below comparable competitive instruments.

## Abbreviated Specifications

### DC VOLTAGE

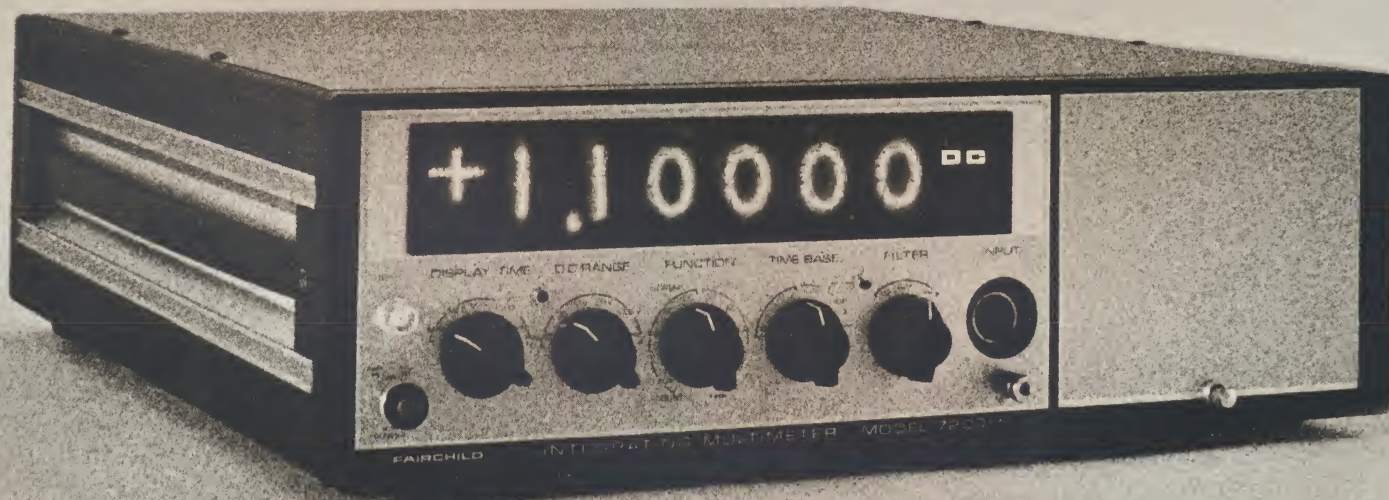
<b>Ranges</b> Manual and remote:	Four ranges 1.00000V f.s. + 10% overrange 10.0000V f.s. + 10% overrange 100.000V f.s. + 10% overrange 1000.00V f.s.
<b>Ranges</b> Auto Range:	Three ranges 10.0000V f.s. 100.000V f.s. 1000.00V f.s.
<b>Accuracy</b> 10V, 100V and 1000V ranges: 1V range:	One second integrating time base $\pm 0.005\% \text{ Rdg. } \pm 0.001\% \text{ f.s.}$ $\pm 0.01\% \text{ Rdg. } \pm 0.002\% \text{ f.s.}$ 0.001% f.s. (10 $\mu$ V on 1 volt range)
<b>Resolution</b>	Manual range
<b>Input Impedance</b>	1V > 1M $\Omega$ 10V > 1KM $\Omega$ 100V > 1KM $\Omega$ 1000V > 10M $\Omega$

### DC RATIO

<b>Range</b>	1:1.00000 +10% overrange
<b>Accuracy</b> With external reference voltages of 10V, 30V, 60V and 100V (at reference condition):	$\pm 0.005\% \text{ Rdg. } \pm 0.001\% \text{ f.s.}$ 0.001% f.s.
<b>Resolution</b>	0.001% f.s.
<b>Input Impedance for unknown signal input</b>	> 1KM $\Omega$
<b>Input Impedance for external reference voltage</b>	> 1KM $\Omega$
<b>Maximum input signal</b>	$\pm 110\text{V}$
<b>External Reference Voltage Range</b>	$\pm 0.5$ to $\pm 110\text{V}$

### COUNTER

Manual (and programmable) start, stop and reset, for totalizer applications.	
<b>Maximum Count Rate</b>	1MHz
<b>Maximum Display</b>	199999
<b>Sensitivity</b>	100mV rms to 100V rms



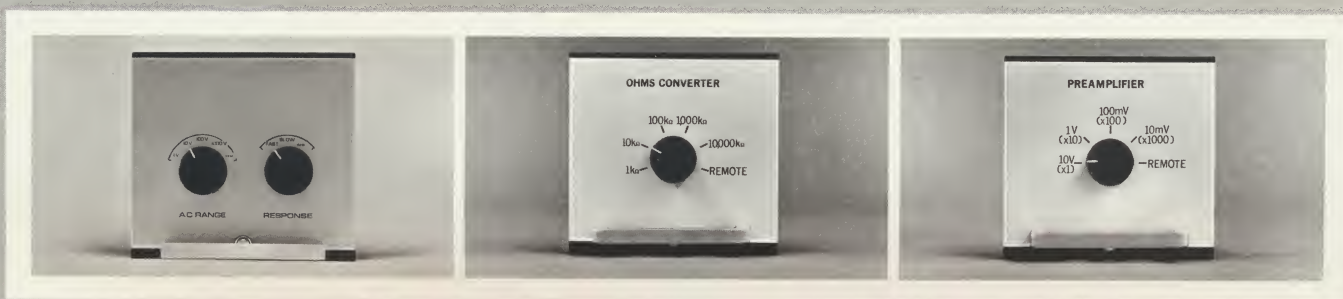


## GENERAL

<b>Common Mode Rejection</b>	With 1K $\Omega$ unbalance in either input lead
DC:	> 140db
AC:	60Hz > 120db
<b>Normal Mode Rejection</b>	True integrating technique provides maximum noise rejection.
<b>Integrating Time Base</b>	Manual and programmable 1.0 sec., 0.1 sec., and 10ms
<b>Polarity</b>	Automatic
<b>Range Response Time</b>	30ms
<b>Notch Filter</b>	The 7200 has a 60Hz Twin-T input filter (front panel switch, and programmable). Provisions are made for other types of input filters.
<b>Signal Circuit</b>	Insulated and guarded connectors provide for signal input from front or rear. Automatic signal switching to plug-in unit or DVM is controlled internally by the function switch. One additional connector is provided on the rear panel for a four-wire $\Omega$ -input. This connector can also be used as a direct input (by passing the input selector) to the Lo-level preamplifier. This eliminates the effects of thermal emf's in the input selector.
<b>Size</b>	17" x 5 1/4" front panel, 20" deep
<b>Power</b>	115-220VAC $\pm 10\%$ , 50-400Hz, less than 30 watts, no fan
<b>Price</b>	\$3500.00

## OPTIONS

<b>Digital Output</b>	All functions, decimal points, polarity, numbers and print command are available through a plug-in harness. To insure proper operation of auxiliary recording equipment, outputs can be standardized to the necessary logic levels and codes. For this purpose, provisions are made for two standard size plug-in cards. Available logic levels are: +30V, +12V, +4V, -30V.
<b>Programing</b>	All switches of the instrument are programmable through a plug-in harness. Two modes of programing are possible: a) Isolated contact closure to the internal +12V logic level (approximately 5mA each), resistive load; b) Provisions are made for two standard size plug-in cards. These cards accommodate level shifts and gates for programing by contact closure or saturated NPN to logic common. Open circuit voltage: +12V, contact load: < 1mA, resistive.
<b>Frequency Time Base</b>	(Optional plug-in board). Provides time base for frequency measurements.
<b>Display:</b>	in KHz
<b>Frequency Range:</b>	10Hz to 1MHz
<b>Time Base:</b>	1 sec., 0.1 sec., 10ms, front panel and remote control
<b>Accuracy:</b>	$\pm 0.005\%$ Rdg. $\pm 1$ count



### AC VOLTAGE MEASUREMENT PLUG-IN (Model DM-10)

This AC converter is a plug-in unit for the 7200. Power supplies are self-contained so that the unit can be adapted into a AC/AC ratiometer. The AC conversion is proportional to the average value of the applied AC voltage. The output is calibrated in rms based on a sine wave input.

#### Specifications

##### Ranges

Four ranges, manual and programmable:  
1.00000V f.s. + 10% overrange  
10.0000V f.s. + 10% overrange  
100.000V f.s. + 10% overrange  
1000.00V f.s.

##### Combined Accuracy and Frequency Response (with Model 7200)

10V, 100V and 1000V ranges:

30Hz-10KHz  $\pm 0.05\%$  Rdg.  $\pm 0.02\%$  f.s.  
10KHz-20KHz  $\pm 0.1\%$  Rdg.  $\pm 0.03\%$  f.s.  
20KHz-50KHz  $\pm 0.2\%$  Rdg.  $\pm 0.05\%$  f.s.  
50KHz-100KHz  $\pm 0.4\%$  Rdg.  $\pm 0.1\%$  f.s.

1V range:

30Hz-10KHz  $\pm 0.1\%$  Rdg.  $\pm 0.05\%$  f.s.  
10KHz-20KHz  $\pm 0.2\%$  Rdg.  $\pm 0.1\%$  f.s.  
20KHz-50KHz  $\pm 0.5\%$  Rdg.  $\pm 0.2\%$  f.s.  
50KHz-100KHz  $\pm 1.0\%$  Rdg.  $\pm 0.5\%$  f.s.

**Input Impedance** Measured at the DM-10 rear connector:  
5M $\Omega$  shunted by < 50pf

##### Response Time

Manual and programmable:  
fast/slow with crossover at approximately 400Hz.

Fast: 500ms

Slow: 5 sec.

### OHMS MEASUREMENT PLUG-IN (Model DM-11)

The DM-11 is a four-wire ohms-converter plug-in unit for the 7200. Power supplies are self-contained so that the unit can be adapted into low-ohms measurement systems.

#### Specifications

##### Ranges

Five, manual and programmable:  
1.00000K $\Omega$  f.s. + 10% overrange,  
resolution 10 milliohms  
10.0000K $\Omega$  f.s. + 10% overrange,  
resolution 100 milliohms  
100.000K $\Omega$  f.s. + 10% overrange,  
resolution 1 $\Omega$   
1000.00K $\Omega$  f.s. + 10% overrange,  
resolution 10 $\Omega$   
10000.0K $\Omega$  f.s. + 10% overrange,  
resolution 100 $\Omega$

##### Combined Accuracy With Model 7200:

1K-100K $\Omega$   $\pm 0.02\%$  Rdg.  $\pm 0.002\%$  f.s.  
1M $\Omega$   $\pm 0.05\%$  Rdg.  $\pm 0.003\%$  f.s.  
10M $\Omega$   $\pm 0.10\%$  Rdg.  $\pm 0.005\%$  f.s.

**Termination** Special input cable with four-wire Kelvin clips

**Low Ohms System** With a DM-12 preamplifier, the low ranges extend to:

100.000 $\Omega$  f.s.  
(resolution 1m $\Omega$ )  
10.0000 $\Omega$  f.s.  
(resolution 100 $\mu\Omega$ )  
1.00000 $\Omega$  f.s.  
(resolution 10 $\mu\Omega$ )

### LOW LEVEL DC MEASUREMENTS PLUG-IN (Model DM-12)

The DM-12 extends the measurement ranges of the 7200 to 100.000mV and 10.0000mV f.s. Power supplies are self-contained so that the unit can also be adapted into low-ohms systems.

#### Specifications

**Ranges** Four manual and programmable gain settings:

$\times 1$ ,  $\times 10$ ,  $\times 100$ ,  $\times 1000$

##### Accuracy

$\times 1$   
 $\times 10$   $\pm 0.01\%$  Rdg.  $\pm 0.003\%$  f.s.  
 $\times 100$   $\pm 0.02\%$  Rdg.  $\pm 0.005\%$  f.s.  
 $\times 1000$   $\pm 0.03\%$  Rdg.  $\pm 0.01\%$  f.s.

##### Input Impedance

$\times 1$  > 1KM $\Omega$   
 $\times 10$  > 1KM $\Omega$   
 $\times 100$  > 100M $\Omega$   
 $\times 1000$  > 10M $\Omega$

##### Offset Current

< 2pA



## FAIRCHILD MODEL 7100A MULTIMETER

The 7100A is a fully-guarded four-digit instrument capable of measuring DC voltage, voltage ratio and resistance. Its high degree of accuracy, its superior stability, and its overranging capability (up to 60% on most ranges without loss of accuracy) make it a suitable substitute for five-digit instruments in many applications. Remote programming, BCD output, and an AC/DC converter are optionally available.

### Abbreviated Specifications

#### DC VOLTAGE MEASUREMENTS

<b>Ranges</b>	$\pm 100.00\text{mV}$ , $\pm 1.0000\text{V}$ , $\pm 10.000\text{V}$ , $\pm 100.00\text{V}$ , $\pm 1000.0\text{V}$ full scale. 60% overranging with no loss in accuracy on 4 lowest ranges, 10% overranging with no loss in accuracy on 1000.0V range.
<b>Accuracy</b>	$\pm 0.01\%$ of Rdg., $\pm 1$ digit; 100mV range. $\pm 0.01\%$ of Rdg., $\pm 2$ digits.
<b>Stability</b>	Internal Reference $\pm 0.01\%$ for 3 months.
<b>Input Resistance</b>	> 1000 megohms; 100V and 1000V ranges 10 megohms.
<b>Autoranging</b>	Operates on both DC volts and resistance. Upranges at 16000 and downranges at 01399.
<b>Input Circuit</b>	Floated and guarded, may be operated up to $\pm 500\text{V}$ from chassis ground.
<b>Maximum Input</b>	1100V can be applied to all ranges without damage.
<b>Measurement Time</b>	250ms, rear panel switch provides a fast setting of 50ms on four high ranges.
<b>Common Mode Rejection</b>	140db at dc, 120db at 60Hz with up to 1000 ohms connected between either side of the source and the voltmeter input.
<b>Normal Mode Rejection</b>	Greater than 20db at 55Hz with 83 $\frac{1}{3}$ ms integration time, increases 20db/decade increase in frequency. Virtually infinite rejection at 60Hz and its harmonics.

#### VOLTAGE RATIO MEASUREMENT

<b>Range</b>	$\pm 1.0000:1$ full scale. A full 60% overranging with no loss in accuracy.
<b>Reference Input</b>	+5V to +16V, input resistance 3 kilohms, 30V maximum input.
<b>Accuracy</b>	+9V to +16V; $\pm 0.02\%$ of Rdg., $\pm 1$ digit.

#### RESISTANCE MEASUREMENT

<b>Ranges</b>	10.000K $\Omega$ , 100.00K $\Omega$ , 1.0000M $\Omega$ , 10.000M $\Omega$ full scale. 60% overranging on all ranges with no loss in accuracy.
<b>Accuracy</b>	$\pm 0.01\%$ of Rdg., $\pm 1$ digit; $\pm 0.02\%$ of Rdg., $\pm 1$ digit on 10.000 megohm range.

#### GENERAL

<b>Visual Readout</b>	Four full decades plus fifth digit gives full range readout of 16000 with display storage. Polarity, decimal point, and measurement units are indicated.
<b>Temperature Coefficient:</b>	$\pm 0.0008\%$ of full scale, $\pm 0.002\%$ of Rdg./ $^{\circ}\text{C}$ .

#### POWER

<b>Standard</b>	115V or 220VAC $\pm 10\%$ , 50-60Hz, approximately 50 watts.
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#### OPTIONS

<b>50Hz Operation—Option 02</b>	Crystal time base changes to give 1/50 and 1/10 second integration time for maximum normal mode rejection at 50Hz.
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#### 122/4 BCD/Programing—Option 03

#### 1248 BCD/Programing—Option 04

<b>Prices</b>	
Model 7100A	\$2075.00
Option 02	No Charge
Option 03	\$175.00
Option 04	\$175.00



#### MODEL DM-03A AC/DC CONVERTER

This plug-in unit adds AC voltage measurement to the basic capabilities of the 7100A.

#### Specifications

##### AC Voltage Ranges

Four manually selected full scale ranges of 1.0000, 10.000, 100.00, and 1000.0 volts rms.

##### Overranging

50% on all ranges except 1000.0 volts.

##### Frequency Response

30Hz-10KHz plus extended response to 30KHz.

##### Accuracy

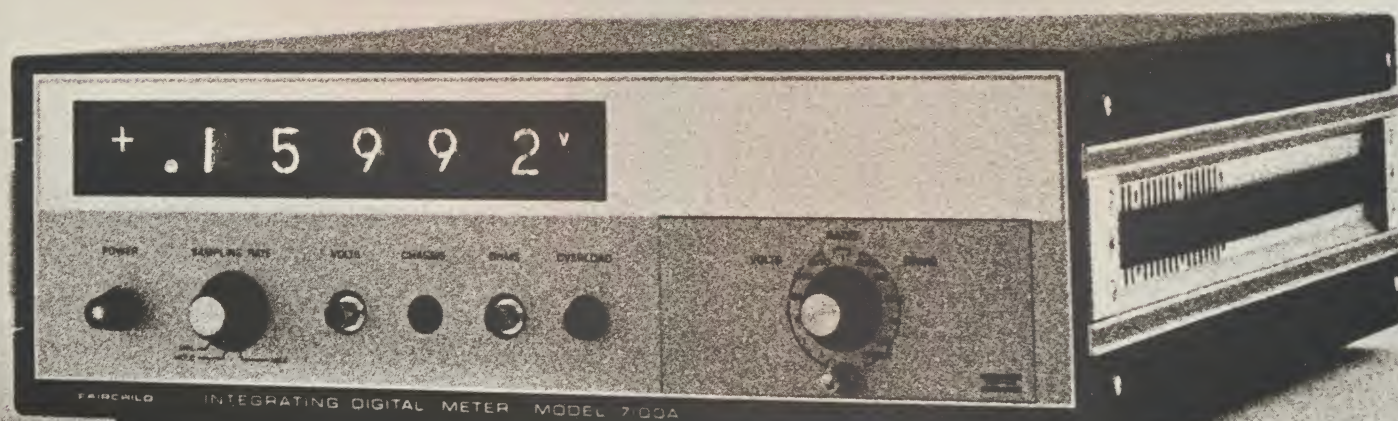
$\pm 0.05\%$  of Rdg.,  $\pm 0.02\%$  of full scale.

##### Input Impedance

5 megohms  $\pm 1\%$  shunted by <50pf.

##### Price

\$500.00





## FAIRCHILD MODEL 7000 MULTIMETER

The Fairchild 7000 is a compact four-digit instrument which combines high accuracy with moderate cost. These features make it an excellent choice for a variety of general testing and measurement needs in the laboratory and on the production line. Like all Fairchild digital meters, the 7000 combines integration techniques and comparison to an internal reference to achieve both noise rejection and stability.

The 7000 provides DC voltage measurements, with AC measurements, resistance measurements, DC current measurements, auto-ranging, and BCD output available as plug-in circuit board options.

### Abbreviated Specifications

#### DC VOLTAGE MEASUREMENTS

<b>Ranges</b>	1.0000V f.s. + 20% overrange 10.000V f.s. + 20% overrange 100.00V f.s. + 20% overrange 1000.0V f.s.
<b>Accuracy</b>	$\pm 0.01\%$ of Rdg., $\pm 0.01\%$ f.s. Above 500V: $\pm 0.01\%$ of Rdg., $\pm 0.02\%$ f.s.
<b>Resolution</b>	100 $\mu$ V on 1.0000V range
<b>Integration Time</b>	50ms
<b>Measurement Time</b>	200ms
<b>Response Time</b>	200ms
<b>Input Impedance</b>	1V > 1K $\Omega$ 10V > 1K $\Omega$ 100V > 10M $\Omega$ 1000V > 10M $\Omega$
<b>Temperature Coefficient</b>	$\pm 0.002\%$ of Rdg., $\pm 0.0008\%$ f.s./ $^{\circ}$ C
<b>Temperature Range</b>	+5 $^{\circ}$ C to +45 $^{\circ}$ C
<b>Normal Mode Rejection</b>	> 30db at 60Hz > 40db at 120Hz > 50db at 400Hz
<b>Maximum Voltage</b>	1200 volts on any range with no damage

#### MECHANICAL

<b>Dimensions</b>	5 $\frac{1}{4}$ " height x 8 $\frac{3}{8}$ " width x 12" depth (half rack size)
<b>Weight</b>	12 lb. (15 lb. maximum with all options)
<b>Power</b>	115V-220VAC $\pm 10\%$ , 50Hz-400Hz < 20 watts, no fan

#### OPTIONAL CAPABILITIES (The options are plug-in cards.)

<b>Auto Range—Option 01</b>	Provides auto ranging on all functions of the 7000.
Up Range Point:	1.2000 12.000 120.00
Down Range Point:	00.980 009.80 0098.0

#### AC Volts—Option 02

<b>Ranges:</b>	1.0000V f.s. + 20% overrange 10.000V f.s. + 20% overrange 100.00V f.s. + 20% overrange 1000.0V f.s.
<b>Accuracy:</b>	50Hz-10KHz $\pm 0.1\%$ of Rdg., $\pm 0.02\%$ f.s. 10Hz-30KHz $\pm 0.25\%$ of Rdg., $\pm 0.05\%$ f.s. 30KHz-100KHz $\pm 1.0\%$ of Rdg., $\pm 0.2\%$ f.s.
<b>Input Impedance:</b>	1 megohm shunted by 50pf
<b>Integration Time:</b>	50ms
<b>Measurement Time:</b>	1 sec.
<b>Overload Protection:</b>	1000VAC or DC (or any combination of both) without damage on any range.

#### Resistance—Option 03

<b>Ranges:</b>	1.0000K $\Omega$ f.s. + 20% overrange 10.000K $\Omega$ f.s. + 20% overrange 100.00K $\Omega$ f.s. + 20% overrange 1000.0K $\Omega$ f.s. + 20% overrange 10000K $\Omega$ f.s.
<b>Accuracy:</b>	1K $\Omega$ , 10K $\Omega$ , 100K $\Omega$ : $\pm 0.05\%$ of Rdg., $\pm 0.02\%$ f.s. 1M $\Omega$ : $\pm 0.10\%$ of Rdg., $\pm 0.03\%$ f.s. 10M $\Omega$ : $\pm 0.20\%$ of Rdg., $\pm 0.05\%$ f.s.
<b>Resolution:</b>	100 milliohms (1K $\Omega$ range)
<b>Integration Time:</b>	50ms
<b>Measurement Time:</b>	200ms

#### DC Current—Option 04

<b>Ranges:</b>	1.0000mA f.s. + 20% overrange 10.000mA f.s. + 20% overrange 100.00mA f.s. + 20% overrange 1000.0mA f.s.
<b>Accuracy:</b>	$\pm 0.13\%$ of Rdg., $\pm 0.02\%$ f.s.
<b>Resolution:</b>	100nA (1mA range)
<b>Integration Time:</b>	50ms
<b>Measurement Time:</b>	200ms
<b>Step Response:</b>	450ms
<b>Overload Protection:</b>	2 amperes may be safely applied to any range without damage.

#### BCD Output—Option 05

1248 BCD Output  
Logical 0:0V  
Logical 1:+5V

#### Prices

Model 7000	\$1150.00
Option 01	\$ 95.00
Option 02	\$ 250.00
Option 03	\$ 70.00
Option 04	\$ 80.00
Model 7000, plus Options 01, 02, 03, 04	\$1550.00
Option 05	\$ 45.00





## FAIRCHILD MODEL 7050 MULTIMETER

The 7050 represents a true breakthrough in the cost/performance ratio of digital multimeters. Only the most recent advances in integrated circuits, packaging, and manufacturing techniques make it possible to offer an instrument of such substantial capabilities at so low a price. The 7050 is a three-digit instrument with both DC voltage and resistance measurement capabilities. DC current measurement is an available option. It incorporates as standard such high-price features as input impedance greater than 1000 megohms, floating input, 50% overranging with no degradation of accuracy, and readout storage (non-blinking display). Yet its low cost makes it an economical replacement for analog type meters, panel indicators, and more expensive digital instruments. It can be used with confidence for general testing on the production line, in quality assurance, in service applications, in educational laboratories, and in a variety of test and control systems.

### Abbreviated Specifications

#### FUNCTIONS

	DC Volts Ohms External Current Shunts Available
DC Volts	1.500V f.s. (1mV resolution) 15.00V f.s. 150.0V f.s. 1000.0V f.s.
Maximum Voltage	1000V may be applied to any range without damage.
Resistance	1.500K $\Omega$ f.s. (1 $\Omega$ resolution) 15.00K $\Omega$ f.s. 150.0K $\Omega$ f.s. 1.500M $\Omega$ f.s. 15.00M $\Omega$ f.s.
Maximum Voltage	125 volts (AC or DC) may be applied to any range without damage.

#### ACCURACY

##### From 10°C to 40°C

DC Volts:	$\pm 0.1\%$ of Rdg., $\pm 1$ digit
K Ohms:	$\pm 0.2\%$ of Rdg., $\pm 1$ digit
M Ohms:	$\pm 2\%$ of Rdg., $\pm 1$ digit

##### From 0°C to 10°C and 40°C to 45°C

DC Volts:	$\pm 0.2\%$ of Rdg., $\pm 2$ digits
K Ohms:	$\pm 0.3\%$ of Rdg., $\pm 2$ digits
M Ohms:	$\pm 3.0\%$ of Rdg., $\pm 2$ digits

#### INPUT IMPEDANCE (Voltage Ranges)

1.5V Range	1000M $\Omega$
15 Volt to 1000 Volt Ranges	10M $\Omega$

#### INPUT CURRENT (Resistance Ranges)

1.5K Range	1mA
15K Range	100 $\mu$ A
150K Range	10 $\mu$ A
1500K Range	1 $\mu$ A
15M Range	100nA

#### READOUT

3 Digital Readout Indicators with Automatic  
Decimal Point  
1 overrange digit  
Automatic polarity indicator  
Display storage (non-blinking)

#### POWER

115VAC  $\pm 10\%$   
50-400cps  
7 watts

#### SIZE AND WEIGHT

Dimensions	3¼" high x 6¼" wide x 7¼" deep
Weight	Less than four pounds
Price	\$299.00







Rack Mounting Brackets



Probe Kit



Model 7460MR Digital Multimeter

## MODIFICATIONS AND ACCESSORIES

Fairchild offers many standard and special modifications and accessories for most units. If your requirements are not met by one of our standard DVM's, contact a Fairchild Instrumentation Field Sales Office. It is staffed and equipped to give you fast service and immediate assistance and information. Direct communications with the factory enable Fairchild Field Engineers to give you accurate estimates and quotations on all special requirements.

**Standard Modifications:** Modifications available at a nominal cost include: rear input connectors, digital output for printer or other output device, remote programming, and special paint.

**Standard Accessories:** Standard accessories which can be provided by Fairchild include: rack mounting brackets (with or without slides), special probes, current shunts, and low thermal EMF probe kits.

**Special Modifications:** Fairchild Instrumentation can also provide modifications to meet special customer requirements. For example: operating capabilities in severe environments based on military specifications including RFI, shock and vibration.

**Model 7460MR:** An example of this capability is the Model 7460MR digital multimeter. The 7460MR is a small, rugged, solid state, militarized instrument which measures DC voltage, DC current, AC voltage, RF voltage, and resistance. It includes a detachable high voltage probe to extend the DC voltage measurements to 30KV, and a probe to extend the RF voltage range to 50MHz.

The 7460MR simplifies the multimeter operation by combining push-button function control with automatic ranging. The operator needs only to push a function switch and the instrument will shift to that function and seek the appropriate range. Remote programming operates in a similar fashion.

### Other special features include:

- Dual slope integration (1/25 sec. integration time)
- 1000 megohm input impedance on the two lower DC voltage ranges
- An "E" symbol to indicate overload conditions
- Readout memory
- A "check" switch to verify that the various functions are operating
- 115 volt 400Hz power line operation (60Hz operation optionally available with a larger package)

## FAIRCHILD INSTRUMENTATION FIELD SALES OFFICES:

### U.S.A.

4546 El Camino Real  
Los Altos, California 94022  
(415) 941-3111

5410 West Imperial Boulevard  
Los Angeles, California 90045  
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TWX: 910-328-6177

50 Jericho Turnpike  
Jericho, L.I., New York 11753  
(516) 333-9311  
TWX: 510-222-4479

2105 Gulf-To-Bay Boulevard  
Suite #4  
Clearwater, Florida  
(813) 446-4619  
TWX: 810-866-0436

8517 39th Avenue, North  
New Hope, Minnesota  
(612) 544-5220

113 Gentry Road  
Hoffman Estates  
Roselle, Illinois 60172  
(312) 894-2060

### EUROPE

FAIRCHILD INSTRUMENTATION LTD.  
Grove House, 551 London Road  
Isleworth, Middlesex, England  
Tel: 560-0838  
TELEX: 24693

Grunwalderstrasse 99  
Munich 90, West Germany  
Tel: 49 18 47  
Cable: FAIRINTA MUNICH



**GENTLEMEN:**

Please send me additional information on the items checked below.

- |   |   |
|---|---|
| <input type="checkbox"/> Fairchild Model 7200 Multimeter  | <input type="checkbox"/> Fairchild Model 7050 Multimeter  |
| <input type="checkbox"/> Fairchild Model 7100A Multimeter | <input type="checkbox"/> Also send me application notes   |
| <input type="checkbox"/> Fairchild Model 7000 Multimeter  | <input type="checkbox"/> I would like to discuss some technical problems with one of your engineers |

Comments \_\_\_\_\_

Name \_\_\_\_\_

Title \_\_\_\_\_ Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

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| <input type="checkbox"/> Fairchild Model 7000 Multimeter  | <input type="checkbox"/> I would like to discuss some technical problems with one of your engineers |

Comments \_\_\_\_\_

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